Bridging geography and economics in local-scale land-use modelling

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LEEDS Institute for Data Analytics

UNIVERSITY OF LEEDS

Consumer Data Research Centre

An ESRC Data Investment

Welcome to the 2017 European Colloquium on Theoretical and Quantitative Geography (2017), organised by the School of Geography and the Leeds Institute for Data Analytics (University of Leeds).

It is a great delight to welcome you to York; a city that was established 2,000 years ago, and has been a substantial human settlement for considerably longer. For those of you with an appetite for history, the Roman Walls, Minster, Railway Museum, and Shambles may be among many sites of interest. For those of a more gregarious persuasion, then the many bars and restaurants of the city and riverside may be more appealing!

The School of Geography at the University of Leeds is somewhat less ancient than the city of York. Nevertheless, we have a long tradition as a centre for research in spatial analysis and quantitative methods, and after many years of participation in the ECQTG we are proud to host you in Yorkshire for the first time. We hope you will find stimulation as ever in the presentations and conversation with acquaintances old and new.

It is a special pleasure to welcome our old friend and mentor Professor Sir Alan Wilson as a keynote speaker. In half a century since the landmark publications of the 1960s, Alan's influence on the discipline has been peerless. We hope that you will especially enjoy the sessions that have been set aside for the appreciation of Alan's work, and will join in lively discussions about its continuing impact and legacy for the future.

Welcoming you to the conference at this time is also particularly exciting for the organising committee because we have recently been awarded substantial funding to create the Consumer Data Research Centre (CRDC) and, to support this initiative, the University of Leeds has also invested heavily in the new Leeds Institute for Data Analytics (LIDA). These programmes aim to bring together diverse groups of academics, businesses, and policy makers to work on critical geographical social issues. As such, the ECTQG is one of the most relevant and important fora for our work.

Best wishes,

Mark Birkin, Michelle Morris, Nick Malleson

(ECTQG Local organising committee)

5. Monsuru Adepeju

Developing a hybrid hotspot approach for improving the accuracy of crime prediction

The ability of different crime hotspot methods to complement each other has been discussed in previous studies. This paper extends the idea of complementarity of the hotspot to develop a hybrid approach in which outputs of multiple methods are combined in order to improve the predictive accuracy. A case study of Chicago crime is presented to demonstrate that a considerable level of accuracy can be gained by using the hybrid approach.

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1. Eric Koomen; Diogo Vasco

Bridging geography and economics in local-scale land-use modelling

Models that simulate land-use patterns often use either geographic, inductive, data-driven approaches or deductive, economic theory based methods to describe the relative strength of the social, economic and biophysical forces that steer the spatial patterns in the various sectors in the land system. This presentation proposes an integrated framework that incorporates both approaches based on a unified assessment for local land suitability following a monetary, utility based logic. The framework is illustrated with a hedonic pricing analysis of urban land values and a net present value assessment for agricultural production system in combination with statistics-based assessments of land suitability for other sectors.

The results show that limited difference exists between the most commonly applied inductive approaches that use either multinomial or binomial logistic regression specifications of suitability. Land-use simulations following the binomial regression based suitability values that were rescaled to bid prices (reflecting relative competitiveness) perform better for all individual land-use types. Performance improves even further when a land value based description of urban bid prices is added to this approach. Interestingly enough the better fitting description of suitability for urban areas also improves the ability of the model to simulate correct locations for business estates and greenhouses.

The simulation alternatives that consider the net present values for agricultural types of land use show the relevance of this approach for understanding the spatial distribution of these types of land use. The combined use of urban land values and net present values for agricultural land use in defining land suitability performs best in our validation exercise. The proposed methodology can also be used to incorporate information from other research frameworks that describe the utility of land for different types of use. Initial applications of this novel methodology in operational land-use modeling frameworks indicate their value for spatial policy preparation.

2. Zahratu Shabrina; Elsa Arcaute; Richard Milton; Michael Batty

Modelling Accessibility of Airbnb in Greater London Area

The growth of Airbnb, a Peer to Peer (P2P) platform for short term rentals, has increased exponentially since its establishment in 2008. The data from Inside Airbnb, which has collected publicly available information of Airbnb listings, shows that in March 2017 there were more than 53,000 listings in London alone. There has been a significant increase of Airbnb listings in only nine years since it was first introduced in London where most of these listings are located in Tower Hamlets, Hackney and Westminster area. This paper investigates how optimal the locations of Airbnb are by computing accessibility measures using gravity-spatial interaction models for Greater London. The accessibility of Airbnb depends on the relative location of Airbnb (origins) compared to the tourist attractions (destinations) assuming that the majority of the people who stay in Airbnb come to visit and travel to these touristic destinations.